DOCUMENT RESUME

ED 401 908 IR 056 183

AUTHOR Schrader, Alvin M.
TITLE One Field or Two? A Definitional Analysis of the Relationship between Library Science and Information Science.
PUB DATE Jan 95
NOTE 81p.
PUB TYPE Information Analyses (070) -- Reports - Descriptive (141)

EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS *Definitions; Differences; Etymology; Foreign Countries; *Information Science; *Library Science; Literature Reviews; *Semantics; Vocabulary
IDENTIFIERS *Conceptual Analysis

ABSTRACT

This study addresses the problem of an adequate distinction between the concepts of library science and information science. The study identifies and analyzes the definitions of these and related terms that have appeared in English-language literature over the past century, and evaluates the logical adequacy of the linguistic expression of these terms. The definitions were examined using the philosophical method of conceptual or definitional analysis. In this examination, several levels of linguistic expression about a domain were identified and analyzed: the name, the nature, the content, the focus, and the function. The analysis of the definitional literature reveals a domain in crisis over its central identity. The literature is characterized by disagreement, contradiction, and inconsistency in the terms used to conceptualize the domain. The absence of conceptual rigor is manifest in the previous attempts to distinguish information science from library science. In order to advance conceptualization and consensus about the domain, there is need for a vision beyond science, beyond technology, and beyond professionalism, to a more basic level of understanding. A unifying theory is needed, one that will map out a unique domain, ground its central function and technology in a societal context, synthesize and simplify its terminology, and articulate an agenda of problems for inquiry. (Contains 82 references.) (Author/SWC)

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One Field or Two?

A Definitional Analysis of the Relationship between Library Science and Information Science

by

Alvin M. Schrader, PhD
Professor, School of Library and Information Studies
University of Alberta

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Abstract

This study addresses the problem of an adequate distinction between the concepts of library science and information science. Its objectives were to identify and analyze the definitions of these and related terms that have appeared in English over the past century or so, and to evaluate the logical adequacy of the linguistic expression of these terms.

The definitions were examined using the philosophical method of conceptual or definitional analysis. In this examination, several levels of linguistic expression about a domain were identified and analyzed: the name, the nature, the content, the focus, and the function.

The analysis of the definitional literature reveals a domain in crisis over its central identity. The literature is characterized by disagreement, contradiction, and inconsistency in the terms used to conceptualize the domain. Nowhere is the absence of conceptual rigor more manifest than in the flawed attempts to distinguish information science from library science.

The study concludes that what is needed, in order to advance conceptualization and consensus about the domain, is vision beyond science, beyond technology, beyond professionalism, to a more basic level of understanding.

Table of Contents

Page

Abstract ii

Statement of the Problem 1

Methodology for Definitional Analysis 12

Findings 20

1. The Name of the Domain 20
2. The Nature of the Domain 30
3. The Content of the Domain 44
4. The Focus of the Domain 51
5. The Function of the Domain 52

Summary Evaluation 60

References 70

Statement of the Problem

The study that is reported here has addressed the problem of an adequate distinction between the concepts of library science and information science. Its objectives were to identify and analyze the definitions of these and related terms that have appeared in the English-language literature over the past century or so, and then to evaluate the logical adequacy of the linguistic expression of these terms.

The following questions were posed for the study. First, what definitions in the literature have posited a conceptual relationship between library science and information science? Second, what form of relationship has been suggested - a relationship of identity, of similarity, of difference, or of disjunction? And third, do any of the extant definitions provide a logically adequate description of the conceptual relationship between library science and information science?

During the latter half of the twentieth century, there has been increasing controversy and concern about professional and scholarly identity, about whether there are separate disciplinary domains of library science and information science, or whether there is only one world of social reality.

From the 1950s until his death in 1982, one of the leading writers on the problems of domain identity was Jesse Hauk Shera. But was he a librarian, a library scientist, a documentalist, an information scientist, or some combination of these?

He received a Ph.D. from the Graduate Library School at the University

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of Chicago in 1944, and he was dean of the School of Library Science at Western Reserve University from 1952 to 1970. His definitive pedagogical text was entitled The Foundations of Education for Librarianship, published in 1972.

In the same year that he was first appointed dean at Western Reserve University, however, Shera also became a charter member of the reorganized American Documentation Institute (ADI). A year later, in 1953, he assumed the editorship of its journal, American Documentation, a post he held for almost eight years, thus making him its longest-standing editor. Moreover, in 1955 he established the Center for Documentation and Communication Research as a research division within the School of Library Science at Western Reserve University.

And yet, in spite of having promoted documentation as a separate field throughout most of his career, in later years Shera [1,2] regarded it as a schism - as "the unfortunate fracture" - that had come to plague librarianship. Near the end of his life he went even further, repudiating the belief that documentation cum information science provided the intellectual and theoretical foundations of librarianship, and denouncing it as well for its 'dehumanizing threat" to the humanistic goals and values of library service. In it, he foresaw "great danger" to traditional standards of professional competence.

This extended reference to Shera's views and activities is not intended as a criticism of him, but rather as a means of providing historical perspective on the persistent problems of domain identity. His simultaneous identification throughout most of his academic career with both library science cum librarianship and documentation cum information science is a familiar legacy. Many of our current educators and researchers continue to have a foot in both intellectual camps, drawing their paychecks from university graduate schools of library science education, while at the same time promoting the cause of information science.

Evidence of the bi-disciplinary view can be found at work on the educational level, where there are now a handful of institutions that offer separate graduate or undergraduate degrees in information science, and an international journal begun in 1983 called Education for Information (although its scope notes appear to acknowledge contributions from library studies as well as from the information profession). On the professional level, there are various associations and journals for information science and its conceptual relatives, some of which have existed for 50 to 100 years and others that are of much more recent origin. As well, numerous conferences have been devoted to information science over the past half-century.

Moreover, as White [3] has reported, efforts in the 1970s to merge the Special Libraries Association (SLA) and the American Society for Information Science (ASIS) were rebuffed. The bi-disciplinary view prevailed, even though, according to White [4, p. 336], the estimated

overlap of ASIS members who were also members of SIA was 35 per cent, and the overlap was even higher among the ASIS leadership. White viewed the objections to the merger as emotional rather than substantive.

At the same time, however, other evidence points to a converging or even a uni-disciplinary view at work. This is most notable on the educational level where, during the quarter-century since the establishment of the School of Library and Information Science at the University of Pittsburgh in 1962, the majority of North American graduate library schools have changed their names to incorporate an "information" component (although, ironically, they have changed the names of their master's and doctoral degrees rather less frequently).

Similarly, on the professional level, at the beginning of 1983 the Association of American Library Schools became the Association for Library and Information Science Education, and its journal in 1984 became the Journal of Education for Library and Information Science. Also at the publication level, the UNESCO Bulletin for Libraries became the UNESCO Journal of Information Science, Librarianship and Archives Administration in 1979 (discontinued at the end of 1983), and Library Research became Library and Information Science Research in 1983.

In the larger historical perspective, it is still too early to predict how the controversy will be resolved. Some writers have foreseen theoretical movement toward a unified domain. Rayward [5, p. 356], for example, has identified several major structural and organizational developments that support the idea of "an emergent disciplinary integration" between librarianship and information science.

On the other hand, some writers, among them Saracevic [6], have urged another kind of resolution - separation and divorce of information science from library science. Still others, such as Garrison [7, p. 365], have gone further and announced the imminent demise of library science and its formal educational system unless efforts are made to establish "a new kind of freestanding and unified information discipline".

Although there are strong political and institutional forces at work that tend in the short term to move events and solutions in one direction or another, ultimately the problems of domain identity must be resolved on philosophical and theoretical grounds. Until this is recognized, the conceptual confusion will continue unabated - as will the calls for more adequate theory and philosophy by proponents of both the uni-disciplinary and bi-disciplinary views of the universe of discourse.

Only a handful of writers have attempted to approach the issues from a philosophical and theoretical perspective. In addition to several notable contributions by Shera [1,2,8], the most important research to use a philosophical method was by Wellisch [9]. Wellisch identified 39 different definitions of the term "information science" in the literature between 1959 and 1971, and examined the substantive terms that appeared in these definitions. Later, Schrader [10] used definitional analysis to investigate 13 generic definitions of information science.

Investigations of the historical origins and development of disciplinary terminology have been published by Mikhailov, Chernyi and Gilyarevskii [11,12], Goffman [13], Cook [14], Rovelstad [15], Woledge [16], Schrader [17], and Vakkari [18]. All of these works have made

useful contributions to selected aspects of the professional identity issue, but none of them has addressed the broader question of the conceptual relationship between library science and information science.

The study reported here was intended to fill this gap. It was undertaken in the hope that it would contribute to a greater understanding within the community of scholars and practitioners of the historical and contemporary problems involved in defining library science and information science. Concomitantly, it was hoped that the study would contribute to a resolution of the conceptual confusion that has long characterized the definitional literature. Such a contribution would assist in the movement toward consensus on domain conceptualization within the evolving community.

Without consensible knowledge, to use Ziman's [19] phrase, progress in conceptualization is impeded, and so knowledge can not advance. Knowledge begins with rudimentary theorizing, in which concepts are expressed as a system of linguistic terms. Such a terminological system is a necessary condition for the development of consensus on the fundamental problems that are posed by inquiry and service activities within a domain. Thus, the definition of a domain constitutes a theoretical framework for thinking about the domain and for extending knowledge about it.

Moreover, to know is to be able to do with greater certainty and effectiveness, and thus adequate conceptualization of a domain is significant for several operational realities. Among the most important of these are the following: curriculum design for differing levels of educational endeavor, structuring of occupational roles and distinctions,

design and management of organizational and institutional services, development of professional and scholarly activities and associations, and protection and enhancement of the public interest. This study was undertaken so that these operational realities could be more firmly grounded in and guided by a comprehensive theory of domain identity.

In passing, it should be noted that some writers and researchers have objected to the need for theoretical inquiry of the kind reported in this study. Some of them appear to eschew the need for definition at all. For example, in a research monograph devoted to the theory of library services, Buckland [20, p. 21] wrote:

> It is probably unnecessary and unwise to attempt to define librarianship too closely. After all, defining things tends to be done by excluding things, and one may come to regret the exclusion.

This is a perplexing statement, since his entire monograph was devoted to theoretical explication. Indeed, he [20, p. 9] specifically noted "the need for a conceptual framework to provide a unifying force" for the field.

Many other similar expressions of this reluctance to engage in formal conceptualization were identified in the definitional literature. For example, in writing about documentation, librarianship, and information retrieval, Chapin and Shilling [21, p. 410] argued that:

> We have no wish to become involved in semantics. During the battle of definitions, a war might be lost.
> There are differences which are easily recognizable between some of the above contrasting terms.

They did not, however, state what these "easily recognizable" differences were. Similarly, Slamecka and Taube [22, pp. 65-66] asserted:

> It is not our intention to add our ounce to the issue of whether librarianship includes documentation, or whether documentalists are information specialists who are special librarians who are librarians (or vice versa), or whether information technology is amateur, black-box librarianship; perhaps we may oblige all and regard ourselves as members of one large family. The crucial issue, from the viewpoint of the librarian family member, is that certain services, which historically seem to fall into the domain of custodial and interpretive functions of his profession . . . are performed outside the profession and, admittedly, with some degree of success and a considerable degree of public acceptance.

A decade later, Reynolds [23, p. 584] echoed this approach:

> Without attempting a taxonomy of special libraries, I would like to force special librarianship between librarianship and information science.

Although these writers stated that no definitional claims were being set forth, in fact their ensuing explications contradicted such disclaimers. Such expressions in their writings as the following reveal acts of definition: "easily recognizable differences", asserting the performance of "certain services" outside librarianship "with some degree of success", and "forcing special librarianship between librarianship and information science".

These descriptions - no matter how informal - are ways of arriving at an understanding of how terms are being used. Such descriptive discourse serves the function of definition, whether the authors are conscious of what they are doing or not.

A second type of objection to theoretical inquiry is based on the

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assumption that ideas issue from inductive reasoning, from empirical observation. A typical expression of this view is by Verhoef [24, p. 193]:

> I shall not try to find a solution here to the problem of defining documentation, for to do so would probably merely add a new definition to those already in existence and in all likelihood it would be just as debatable as all the others which have been formulated to meet the objections, if they really exist, to the FID [International Federation for Documentation] definition. In my opinion it is much more useful to analyse the practice of documentation and wherever possible to stress the differences and the similarities between documentation and librarianship.

Similarly, in her analysis of the information science content in library school curricula that could be determined from calendar descriptions, Tague [25, p. 90] wrote that:

> In this article, information science is defined in terms of its use.

Even more recently, Boyce and Kraft [26, p. 153] revealed that this approach has still not been abandoned in favor of more rigorous theorizing. They wrote:

> We have set our limits [to the bounds of information science] on the basis of what is being done by those we call information scientists and what is being published in what we consider the information science literature. We have avoided areas such as library automation, which are primarily technological and thus offer little in the way of either theories or principles in the classical sense.

Although these authors denied that they were engaged in the process of definition, their informal descriptive discourse served that function in

each instance. It is a misguided positivistic assumption that the act of formal definition can somehow be avoided. Every process of description or characterization is an act of defining, regardless of the writer's lack of awareness of the process in which she or he is thus engaging.

As Popper [27, p. 46] has pointed out:

> Observation is always selective. It needs a chosen object, a definite task, an interest, a point of view, a problem. And its description presupposes a descriptive language, with property words; it presupposes similarity and classification, which in its turn presupposes interests, points of view, and problems.

Buckland [28, p. 15] has also dismissed the positivistic approach:

> It was someone who liked to infer definitions from observation rather than first principles who came up with my favourite definition of information science: "Information science comprises those topics taught in library schools that were not in the curriculum of the Graduate Library School in Chicago in 1950.

Nonetheless, this was the kind of operational distinction that Fosdick [29, p. 101] used as the basis of a survey of information science components in graduate programs of library science education. He defined information science components as "non-traditional" courses or as courses

> . . . that would not have been offered in library schools prior to the interest in and awareness of information science as a field in its own right in the 1960s.

This and many similar surveys, including the most recent by Tenopir [30], are flawed and misleading because of equally inadequate conceptualizations. Incidentally, some of the bibliometric studies of information science literature share the same deficiency, notably the work

by Small [31], in which he "defined" a core set of information science journals through his own act of personal selection of fifty titles.

These atheoretical approaches to definition are not only positivistic, but suffer as well from arbitrariness and idiosyncrasy. Raw empiricism, then, must give way to the logic of definition, so that domain conceptualization can be evaluated and refined according to the methods of philosophy.

A third type of objection to theoretical inquiry is Bennett's 1988 [32] claim that many definitions of information science and its conceptual antecedents were not meant to be taken seriously as definitions. In commenting on an analysis by Schrader [17] of such definitions, Bennett [32, p. 55] argued recently that:

> Schrader may have assumed that the widely divergent definitions of information science actually meant what they said, rather than being interpretations that serve other, more mundane purposes, such as personal and professional advancement; rather than being theoretical explications of a new science, the interpretative conventions, especially of librarians, reveal patterns of ideological displacement.

Bennett's speculations notwithstanding, definitions must be taken at face value for what they claim to be, and not as nebulous psychological manifestations of "ideological displacement" or of occupational aspiration. The latter motivations do not excuse and justify poor scholarship and inadequately refereed publications. To dismiss definitional claims in advance of rigorous analysis in the way that Bennett has done, so that nothing in the professional literature need be either read or indeed published on its own terms, makes the literature

redundant. And without the existence of definitions that are intended to be taken seriously, there is no possibility for learning from our errors and for thereby making progress in conceptualization. Anything less would violate the fundamental tenets of logic, which demand at the most elementary level that good reasons be given for claims that are made public.

Methodology for Definitional Analysis

Definitions of library science and information science were examined using the method of definitional analysis. This is one of a family of philosophical methods referred to as logical and conceptual analytic techniques (see Steiner, [33, 34, 35]).

Definitional analysis is an *a priori* method in which the linguistic expression of a concept is examined and rendered explicit so that the system of terms that are used to express the concept can be evaluated according to the rigor of logic.

In this process, the terms comprising the definitional expression are explicated and basic concepts are identified. For each basic concept, key terms and their synonyms are brought together, and subsumed terms are similarly explicated. This process results in the development of a chain of related definitions. Logical adequacy can then be considered.

What is sought in the first stage of definitional analysis is a one-to-one correspondence between the term representing the concept and the terms representing its meaning.

In this correspondence, a definition can be thought of as an abbreviatory statement of equivalence relations that specify the conditions under which the defined term may be substituted for the defining term or terms. A definition can thus be treated as a kind of substitution rule for equivalence relations in which fewer terms are substituted for more terms.

In mathematics, the substitution rule permits the construction of a

mathematical equation. Similarly, in linguistic expression, the substitution rule permits the construction of a definitional equation. Such an equation can be represented in the following way:

$$\underline{\text{definiendum}} =_{df} \underline{\text{definiens}}$$

where '<u>definiendum</u>' stands for the defined term,
'<u>definiens</u>' stands for the defining terms, and
'$=_{df}$' stands for equivalence if and only if.

In a definition, then, the defining terms set forth the necessary and sufficient conditions for using the defined term. These conditions constitute the essential characteristics or properties of the concept that is linguistically represented by the <u>definiendum</u>, that is, by the defined term. As Fairthorne [36, p. 711] expressed these conditions in talking about a domain:

> Any discipline must define its scope. That is, it must define what matters it will study explicitly.
> . . . .
> To begin with, the scope must include all those, but only those, phenomena that are essential to the nature of the study.

Once the meaning of a term has been explicated by means of a definitional equation, the adequacy of its linguistic expression can then be evaluated. Steiner [34, chapter 4] has set forth the criteria for definitional adequacy, that is, for determining that a definition is of epistemic worth. Such criteria relate to the logic of language, namely: exactness, exclusivity, exhaustiveness, and external coherence.

The criterion of exactness demands that the essential characteristics - that is, the differences - which distinguish a term's usage from the usage of all other terms must be delineated. This means that accidental characteristics must be excluded from a definition. An example of a definition in which an accidental feature is treated as essential would be a definition of information science that stipulates it to be concerned with information service for business and industry. Another example would be a definition of library science that stipulates it to be the study of libraries.

A different kind of violation of the criterion of exactness involves circularity. In circular definitions, the term that represents a concept also appears in the system of terms that express its meaning. An example would be a definition that stipulates information science to be the science of information, without further explication.

The criteria of exclusivity and exhaustiveness demand that the definition of a term must be inclusive of all the linguistic elements - but only those linguistic elements - that are necessary for its usage. An example in which these criteria are violated would be a definition of library science that, without mention of clients, stipulates it to be the management of collections of materials for use.

Another kind of violation occurs when a writer provides examples or instances of a term's usage instead of a system of terms that are exhaustive of the concept that is being expressed. To illustrate, consider the following definition: "information science is a science that draws on disciplines such as computer science and linguistics."

Also ruled out by these criteria are definitions which contain a residual or junk category. An example of such a definition would be the following: "information science is the study of information, its properties, its creation and dissemination, etc." Other readily recognized references to a residual category include: "and so on", "and the like", "and others", and, "and so forth". (Etc.)

The criterion of external coherence demands that the definition of a term must be related to extant theoretical knowledge, that it take account of all other related historical and contemporary usages. An example of a definition that violates this criterion would be one that stipulates what information science is, but not what library science is; such an approach is inadequate because there is a longstanding literature that conceptualizes the nature of library science. Another example would be a definition that postulates teaching as the central function of library science; there is a longstanding literature that conceptualizes the domain of formal education (see Wilson, [37]). A further example would be a definition that stipulates information science to be information counselling; there is a longstanding literature of counselling psychology.

Since the function of defining concepts is to construct cognitive claims (concept formation), and the function of analyzing concepts is to evaluate cognitive claims (concept analysis or definitional analysis), these processes as applied to domain conceptualization can be described as rudimentary descriptive theorizing. And their products constitute rudimentary descriptive theory.

In the study that is reported here of the epistemic worth of

definitions of library science and information science, five components or levels of linguistic expression about domain conceptualization were identified and analyzed: the name, the nature, the content, the focus, and the function. These components constituted a typology of linguistic levels for ordering the explication and evaluation of the definitions. This typology shaped the structure of the analysis in the chapter that follows.

The names of the domain constituted the first level of linguistic ordering among the terms found in the definitional literature.

The second level of linguistic ordering related to the nature or kind of domain, for example, whether it was taken to be a study, a science, a practice, an art, a technology, and so on.

The third level of linguistic ordering concerned the terms used to describe the content of the domain, for example, whether the domain was taken to deal with knowledge, recorded knowledge, information, recorded information, books, documents, symbols, or something else.

The fourth level of linguistic ordering related to the focus of the domain, that is, whether the domain was taken to serve objects, persons, or both objects and persons; the notion of 'objects' must be broadly conceptualized to encompass both physical and immaterial entities.

And the final level of linguistic ordering concerned domain function (role, activity, doing). In a social enterprise, functions can be specified for one or more classes of domain agents; for example, an affector function would be represented in the statement that "the librarian guides access to selected materials", while an example of an

affectee function would be represented in the statement that "the user seeks access to relevant materials".

To illustrate the process of explicating a definition according to its linguistic expression, a definition that took library science to be "the management of collections of books" would be set forth in the following way as a definitional equation:

library science $=_{df}$ the management of collections of books

This definition is, first of all, about the name 'library science'; second, about a kind of practice, 'management'; third, about a kind of content, 'books'; fourth, a definition that focuses on objects, 'collections of books'; and finally, a definition about a kind of function, 'to manage'.

Similarly, a definition that took information science to be 'information counselling' would be explicated in the following way as a definitional equation:

information science $=_{df}$ information counselling

This definition is, first, a definition about the name 'information science'; second, a definition about a kind of practice, 'counselling'; third, a definition about a kind of content, 'information'; fourth, a definition that focuses on people (although this focus is not explicitly expressed); and finally, a definition about the function 'to counsel'.

The source data for the study reported here constituted all extant definitions of library science, information science, and their conceptual

antecedents and relatives that have appeared in English in the professional literature over the past century or so.

Extant definitions were identified through comprehensive and exhaustive searches of many sources: indexing and abstracting services, annual reviews that appear in the journal and serial literature, glossaries, anthologies, key paper collections, bibliographies, and, most importantly, the citation trails that issue from the published record.

In identifying definitions for inclusion in this study, it should be immediately noted that not all of them were intended by their authors to constitute formal conceptualizations, nor were the papers in which they appeared necessarily intended to constitute formal theoretical explications of the domain of library science or of information science.

However, following the approach taken by Kroeber and Kluckhohn [38, p. 78] in their landmark study of extant definitions of culture, the importance of documenting the full range and variety of generic ideas was the major consideration in the present study as well. They wrote:

> Some [definitions] were hardly intended as formal definitions at all but rather as convenient encapsulations of what was taken as generally agreed upon. Nevertheless, it seemed important to us to document fully the range and variety of nuclear ideas and their possible combinations. . . .
>
> The objective of our taxonomy is to illustrate developments of the concept [of culture] and to bring out the convergences and divergences in various definitions. In our classification and our critical comments we realize that we are taking brief statements out of the larger context of the author's thinking. But our purpose is not to make an overall critique of certain writers. It is rather to point up the important and useful angles from which the central idea has been approached.

It should be noted in passing that definitions which focused narrowly on a type of library setting were excluded. Institutional definitions tend to disregard the larger professional context; for example, most theories of academic librarianship claim that the function of academic librarians is to teach, and these theories are resolutely indifferent to the broader functions of librarians who function in other physical and cultural settings (see Wilson, [37]).

Findings

More than 1,500 English-language definitions of library science and information science that have appeared in the literature over the past century or so were analyzed for this study. Their explication and evaluation below follow the five levels of linguistic ordering that were identified for domain conceptualization in the previous chapter - name, nature, content, focus, and function. Under each of these linguistic components, the findings of the study are presented in two stages: first, explication, and second, evaluation.

1. The Name of the Domain

1.1. Explication

While only a handful of synonymous terms for library science have appeared in the definitional literature - library economy, bibliothecal science, librarianship, library service, and applied bibliography - the literature of information science is replete with domain neologisms. Schrader [17] identified approximately 40, among them the following: bibliography, communication and information science, information and communication science, documentation science, documentalistics, scientific documentalistics, documentology, documentistics, emmorphosis, comparative informatics, documental informatics, documentary informatics, scientific informatics, infometrics, informetrics, informatistics, informology, informantics, information systems engineering, management information systems, and telematics.

With respect to those neologisms that have been used in the definitional literature to conceptualize the relationship between library science and information science, these can be clustered into five more or less distinct sets: a) those that argued that they are different domains; b) those that specify a subordinate relation of information science to library science; c) those that specify a subordinate relation of library science to information science; d) those that treat library science and information science as one domain; and e) those that subsume both library science and information science under a superordinate domain.

The different usages are elaborated below:

A) Different Domains

Virtually every conceivable dichotomy of names has been presented in the definitional literature to differentiate library science from information science. The major disjunctions advanced by writers have been the following:

Librarianship	- Communication Sciences
Librarianship	- Documentation
Librarianship	- Documentation and Information Work
Librarianship	- Informatics
Librarianship	- Information Industry
Librarianship	- Information Professions
Librarianship	- Information Science
Librarianship	- Information Science and Engineering
Librarianship	- Information Specialist
Librarianship	- Information Storage and Retrieval
Librarianship	- Science Information Work
Library Profession	- Information Profession
Library Science	- Informatics
Library Science	- Information Science
Library Science	- Science Information Work
Library Science	- Social Cybernetics
Library Service	- Documentation

B) Information Science as a Subset of Library Science

A similar diversity of names was used by writers to argue that information science is a subset of library science. This subordinate relation of information science is, most notably, the position adopted by the American Library Association [39] in its policy statement "Library Education and Manpower," which was originally written by Lester Asheim [40] in 1968. It is also the position of the ALA's Committee on Accreditation [41], which controls the standards for accrediting first professional degree programs in library and information science education at the graduate level in Canadian and American universities.

Among the combinations advanced by writers were the following:

Subset	Inclusive term
Documentation	- Bibliographic Control
Documentation	- Bibliographic Management
Documentation	- Bibliographic Organization
Documentation	- Librarianship
Documentation	- Library Activities
Documentation	- Science Information Specialist
Documentation	- Special Librarian
Information Science	- Librarianship
Information Science	- Library Field
Information Sciences	- Librarianship
Information Science and Documentation	- Librarianship
Information Science and Documentation	- Library Science
Information Science, Documentation, Informatics, and Informatology	- Librarianship
Information Science, Information Technology, Information Retrieval, and Documentation	- Library Science
Information Science, Systems Analysis, and Documentation	- Librarianship
Information Science, Operations Research, Systems Analysis, and Mechanization	- Librarianship
Information Science and Media Librarianship	- Librarianship

C) Library Science as a Subset of Information Science

In this category of definitions, writers frequently treated information science as an enlarged domain, within which library science was considered to be only one among several subordinate entities.

The following combinations typified the definitional literature of library science taken as a subset of information science:

Subset	Inclusive term
Librarianship	- Documentation
Librarianship	- Information and Communications Communities
Librarianship	- Information Engineering and Information Science
Librarianship	- Information Management
Librarianship	- Information Professions
Librarianship	- Information Resources Management
Librarianship	- Information Science
Librarianship	- Information Science and Technology
Librarianship	- Information Studies
Librarianship	- Information Technology
Library Science	- Information Engineering
Library Science	- Information Professions
Library Science	- Information Science
Librarianship and Documentation	- Information Science
Librarianship, Documentation, Computers, Communications, and Graphic Arts	- Information Science
Library Science, Archival Science, Information and Documentation Science, Journalistic Science (and others)	- Information Science
Library Science, Computer Science, Cybernetics, Social Sciences (some), and Liberal Arts (some)	- Information Science

D) A Unified Domain

In this category of definitions, writers employed various combinations of domain neologisms to conceptualize a unified domain of library science

and information science. Among these combinations were the following:

Documentation and Librarianship
Documentation, Library and Archives
Information/Documentation/Librarianship
Information and Library Science
Information Library Archive Work
Librarian and Information Officer Profession
Librarianship and Documentation
Librarianship and Information Science
Librarianship and Information Service
Librarianship and Information Work
Library and Documentation Community
Library and Information Profession
Library and Information Professions
Library and Information Science
Library-and-Information-Science
Library (and Information) Science
Library and Information Sciences
Library and Information Services
Library and Information Studies
Library Information Field
Library/Information Field
Library/Information Profession
Library Information Professions
Library Information Science
Library/Information Science
Library/Information Science Profession
Library Information Work
Library/Information Work
Library Studies and Information Science
Library/Documentation/Information Science
Library/Media/Information Science Field

E) A Superordinate Domain

In this category, writers posited a larger domain encompassing both library science and information science, and frequently many other domains as well. Favorite neologisms were information sciences (pluralized), information management, information resources management, information profession, information professions, information disciplines, and even communication science. Some writers have begun to substitute information

management, or the information profession, for the term 'information science', and generally they see both library science and information science as subsets of these newest labels.

The most comprehensive work along these lines is by Machlup and Mansfield [42], who argued for an umbrella concept of the "information sciences" on the rationale that many of the newer disciplines focus on information as their object of study. Included in their concept of all-embracing information sciences were fully twenty disciplines and subdisciplines, among which were: information science taken in a narrow sense as technological applications in information handling, library science, computer science, artificial intelligence, cognitive science, linguistics, and information theory. They also recognized that there were arguments for conceptual connections between information science and computer science, and between information science and library science.

Typical combinations of neologisms that subsumed both library science and information science under a larger domain were the following:

Components	Superordinate Domain
Information Science and Librarianship	- Social Epistemology
Information Science and Library Science	- Communication Science
Librarians, Archivists, Records Managers, Audiovisual Specialists, and Information Scientists	- Information Management
Librarian/Archivist, Library Director, Library Scientist, Author/Writer, Editors, Publisher, Abstractor/Indexer/ Cataloger, Information Counselor, Operations Analyst, Research Assistant, Subject Specialist, Online Searcher, Reference Librarian, Referral Specialist, Technical Information Specialist, Systems Analyst, Operations Researcher, Computer Systems Analyst, Information Scientist,	

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Systems Designer, Audiovisual Specialist, Computer Scientist	- Information Professionals
Librarians, Information Scientists, and Information Managers	- Information Transfer
Librarian, Special Librarian, Documentalist, Literature Analyst, and Information Scientist	- Information Field
Librarianship and Information Science	- Information Work
Libraries and Information Centers, Word Processing Programs, Computers, Data Banks and Information Systems, Records, Programs and Depositories, Reports Control and Inventories, Statistical Programs and Data, Paperwork Management, Printing and Reprographic Programs, and Microform Programs	- Information Management
Ditto	- Information Resources Management
Libraries and Report Centers, Training, Marketing, Intelligence, Systems, Design, Information Brokerage, Information Units	- Information Management
Ditto	- Information Professional
Libraries and Library Science, Computers and associated automation technologies, Statistics and Probability, Communication and Telecommunication, Publishing, Printing and Replication, Microform and Miniaturization Technologies, Information Sciences, Systems and Management Sciences, and Information Arts	- Information Disciplines
Ditto	- Information Professions
Library and Information Professions	- Information Work
Library/Information Science	- Information Handling Spectrum
Library Science, Archivistics, Documentation and Information, and Communication and System Theory (some)	- Information Sciences
Library Science, Computer Science, Linguistics, Electrical Engineering, and Cybernetics	- Information Sciences
Library Scientist, Information Management, Data/Information Preparation for others, Data/Information Analysis for others, Searching on behalf of others, Information Systems Analysis, Information Systems Design, Communications Researcher, Computer Scientist, Information Scientist	- Information Professionals
Library Scientists, Computer Scientists, and Communication Scientists	- Information Scientists
Media, Library, and Information Science	- Communications Profession

1.2. Evaluation

Analysis of the definitional literature reveals a considerable proliferation of domain names. Just as almost every possible dichotomy of neologisms has been presented in an attempt to differentiate between library science and information science, so too, almost every possible combination of neologisms has appeared to advance their conceptualization as a single domain. It is doubtful if any other domain has gone through so many proposals for new names as have library science and information science over the past century; an explanation for this phenomenon is not entirely clear.

What does emerge clearly from the literature, however, is that the variety of new names represents a rhetoric of labels rather than a logic of definition. These labels have, for the most part, been advanced without adequate recognition of historical context, and without adequate treatment of conceptual antecedents and the definitions that were posited in the past.

This is nowhere more evident than in the confused deliberations of the Conference on Training Science Information Specialists [43, p. 116] held at the Georgia Institute of Technology in Atlanta. There, the new linguistic fashion - information science - was unveiled and documentation was thus abandoned, with the following observation:

> Documentation and documentalist. We have avoided use of these two terms because of the wide variation in their use and in the numerous interpretations of their meaning. We suggest, therefore, if anyone should wish to use these terms he should state his particular definition.

Nonetheless, ignoring the lesson of linguistic confusion that had come to be represented in the concept of documentation, the participants at the conference adopted the neologisms of "information science" and "information scientist". The definitions that were promulgated for these terms, however, were no more satisfactory than the nomenclature just abandoned. Information science was defined as:

> The science that investigates the properties and behavior of information, the forces governing the flow of information, and the means of processing information for optimal accessibility and usability. The processes include the origination, dissemination, collection, organization, storage, retrieval, interpretation, and use of information. [41, p. 115]

And an information scientist was defined as:

> One who studies and develops the science of information storage and retrieval, who devises new approaches to the information problem, who is interested in information in and of itself. [41, p. 114]

These definitions were not interrelated in a logically acceptable way; a science can not be described with one system of terms while its practitioners are described with a quite different system of terms. Moreover, the definitions did not acknowledge the existence of library science, and did not explain how information science was related to it.

Just how far domain neologisms have been used in an ahistorical way is exemplified in comments by Skolnik [44, p.2], on the occasion of the change of name of the Journal of Chemical Documentation to the Journal of Chemical Information and Computer Sciences:

> Ostensibly, the new name [for the journal] is not the best of all possible names. It is longer than we would like it to be, yet two words shorter than Journal of Information Science and Computer Science in Chemistry, which is what the new name really means. The new name has the advantage that the two terms, 'information science' and 'computer science', can mean almost anything one wants it to mean. Thus the new name is considerably less restrictive than the concept of 'chemical documentation'.

In one of those instances where reality mirrors fiction, this passage is reminiscent of Lewis Carroll's [45, p. 124] Humpty Dumpty in "Through the Looking Glass, and What Alice Found There":

> 'When I use a word," Humpty Dumpty said in rather a scornful tone, "it means just what I choose it to mean - neither more nor less."
>
> "The question is," said Alice, "whether you can make words mean so many different things."
>
> "The question is," said Humpty Dumpty, "which is to be master - that's all."

It seems self-evident that the continuing invention of new names to describe library science and information science has not solved the fundamental problem of disciplinary conceptualization. They constitute a moving target for critical analysis because they are used in variant ways without regard to historical context. The vast majority of them are names without concepts, neologisms "of no fixed address."

2. The Nature of the Domain

2.1. Explication

Probably the most frequent basis in the definitional literature for distinguishing between library science and information science has been perceived differences in their respective natures. These differences have been based upon characterizations of their philosophical and sociological status.

Several dichotomies have dominated the claims that there are different domains of library science and information science: study-practice, science-profession, science-humanism, and innovation-tradition.

Many writers have argued that information science is an area of inquiry or science that furnishes the research foundations for library science, which is thus taken to be a social practice, a service, a profession, an occupation, or an application. A typical expression of this type of characterization is by Borko [46], who argued that librarianship and documentation were applied aspects of information science, which he considered to be an interdisciplinary science.

Another typical expression of this dichotomy is by Giuliano [47, p. 345]:

> Information science comprises the set of research and development undertakings necessary to support the profession of librarianship. Just as a medical scientist need not be a medical practitioner, an information scientist need not be a librarian.

Tague [25, p. 96] also subscribed to this distinction:

> There is a danger, if information science becomes too integrated with library science, that its essential nature - analytical, technological, quantitative, research-based - will become diluted.

Shera, as noted in the introductory passages, was also a longtime advocate of the research function of information science before his change of mind later in his career. For example, in 1976 he [48, p. 40] wrote:

> [Information science] deals with the behavior of information in all its forms. Information science, unlike librarianship, is not a codified body of practice, but a field of inquiry, drawing to itself the work of many disciplines: mathematics, linguistics, communication theory, anthropology, and even some aspects of medicine and psychology. Its findings are of great importance to librarians, and it can well lay the intellectual foundations of a future theory of librarianship with its findings eventually absorbed into library practice.

In his later recantation, Shera [2] returned to what is another familiar dichotomy - science versus humanism. He argued that librarianship is a humanistic enterprise, not a scientific enterprise or a scientific technology, and that as a consequence, information science was inadequate as a theoretical and intellectual base for it.

Another frequent theme in the definitional literature was the contrast between innovation and tradition. This was frequently conflated with the dichotomies described above.

The innovation-tradition distinction was more of an attitudinal distinction than a conceptual one. Hence, information science was described as scientific, innovative, non-traditional, even revolutionary, while library science was characterized as humanistic, historical, classical, traditional, conventional, or conservative.

Generally speaking, the attitudes revealed in these characterizations were negative toward library science. Among the more explicit attitudinal descriptions were the following: "rigidly traditional librarianship",

"rigidly conventional librarianship", "older more conventional librarianship", "conservatism in essential techniques", "the passive mode", and "reactive".

The negative references to library science were accompanied by contrastingly positive references to information science: "new practices", "new skills", "the new technology", "the new information realities", "radically new methods", "a new discipline", "the new profession", "newer developments", "modern developments", "the vigorous young discipline", "the still-young field", "fresh approaches", "keener insight", "assertive", "dynamic", "proactive", "more complex", "more sophisticated", and "more intensive".

Taube [49, p. 91] wrote frankly about this attitudinal approach:

> Early in 1952 I had arranged . . . to teach a course in some of the new developments in information-handling. I was asked for a name for the course . . . and I suggested the standard term "cataloging" or, if you will, "advanced cataloging." I was advised not to use such a name because the students would not take such a course. I then suggested the more glamorous term "documentation." I may say that it got me students, but it has created a problem ever since of explaining what documentation is. . . .

Artandi [50, pp. 16-17] also gave expression to the attitudinal dichotomy between information science and library science:

> [In] information science we are often concerned with problems that are qualitatively the same as library problems at the same level, except that we are considering these with more sophistication in order to cope with and utilize changes which have occurred in the environment in which we now need to operate.

An extreme view that illustrates these attitudinal dichotomies was

expressed by Rees and Riccio [51, p. 108]:

> It is unreasonable to suppose that librarianship can remain in splendid, humanistic isolation untouched by the scientific and technological revolution progressing around it.

Palmer [52, p. 12] expressed even more extremist sentiments, and added another element rarely admitted by the proponents of information science - gender bias:

> Because the image of libraries and librarianship attracts applications mostly from women who have undergraduate preparation in the humanities and because the library image draws very few innovative change agents or individuals with scientific backgrounds, information science education should be divorced from the library image that inhibits effective recruitment of promising information scientists. This statement is not intended to detract from the success of library schools in educating large numbers of professionals to fill niches in low-paying, labor-intensive libraries.
>
> . . . .
>
> Since society is being faced with ever more rapid change, future shock argues for the rapid establishment of information science schools and programs free from the conservative hand of ALA accreditation, free from the old image of libraries and librarianship, and free from the essentially Nineteenth Century patterns of library organization and management.

It should not be concluded that the legacy of discontent and hostility was all one-sided. Both Shera and Wright, among others, have written disparagingly of information science. Shera [2, p. 387] contended that:

> The great danger with which information science threatens librarianship is the loss of control of the library profession to other and less competent hands.

Similarly, Wright [53, p. 46], in a curiously flawed reading of the nature of information theory, charged that Shannon's "mechanistic

assumptions" about communications technology had severely limited the potential of information theory, and that the current emphasis on system design, production, implementation, and control had led to a situation in which:

> The schools of librarianship and information science are therefore turning out "control artists" - the data mechanics who tinker with information systems but stumble over the access problem because they can't control ideas.

In addition to the dichotomies described above, a variety of analogies and metaphors were used to express the nature of library science and information science. The following quotations illustrate the types of analogies found in the literature:

> "Library science is as different from information science as is the study of mathematical principles from the use of arithmetic in cost accounting or space navigation."
>
> "The goals of information science are as different from those of librarianship as are the goals of doctors different from those of hospital administrators."
>
> "Without the study of the nature and properties of the knowledge on his shelves or in his computer, the librarian or information scientist is like a surgeon practised in operational techniques and equipment, who knows nothing of the structure of the bodies on which he operates."
>
> "It has been suggested that defining library science is rather like a cat trying to define a rat - it cannot, but it knows one when it sees it."

In addition to these analogies, metaphorical expressions have frequently been used in the literature to describe the domain and structure of information science, sometimes in relation to library

science. The most common metaphors have centered around the notions of spectrum and continuum.

Among the expressions were the following: "a broad spectrum with overlapping regions", "a continuous spectrum", "a spectrum of labels", "one broad spectrum", "a spectrum of concerns that are part of one body", "an information spectrum", "the information-handling spectrum", "a disciplinary continuum", "a broad continuum", "an entire continuum", "two areas that impinge on one another as overlapping circles", "at the heart of", "at the vortex of", "the apotheosis of", "the parent tree and its branch activities", "a Venn diagram gone crazy", "an information solar system", and "information planets".

The following explication of linguistic terms shows the wide diversity of views about the nature of library science and information science. These views are organized around the taxonomy of domain relationships presented earlier: different domains, set-subset relations, a unified domain, and a superordinate domain.

A) Different Domains

In this set of definitions is found a great frequency of conceptual mixtures of philosophical and sociological characterizations. Among others, the following dichotomies appear as linguistic expressions in the definitional literature of library science and information science:

Nature of Library Science	Nature of Information Science
a field	-an interdisciplinary science
humanistic tradition	-a science and technology
humanistic tradition	-a field of scholarly investigation

institutional	-a new scientific discipline
library community	-a nascent science
a practice	-scientific and experimental research
a codified body of practice	-intellectual foundations
a codified body of practice	-a field of inquiry
a profession	-an emerging discipline
a profession	-an emerging metascience
a profession	-a science
a profession	-research and development
a profession	-a multidisciplinary profession
a profession	-a field of intellectual endeavor
professional knowledge	-scientific foundations
service-oriented	-research-oriented
service-oriented	-intellectual and theoretical base
service-oriented	-study and design of systems

B) Information Science as a Subset of Library Science

Among these characterizations are the following:

Information Science	Library Science
one art of...	- the art
intellectual and theoretical base	- the generic discipline
an emerging discipline	- a profession
interdisciplinary concepts	- a service
interdisciplinary areas of research and study	- the generic discipline
research	- an occupation
an area of research	- the generic term
a science	- a philosophical study
a scientific area	- a prescientific discipline
new specialties	- a field

C) Library Science as a Subset of Information Science

This category includes the following distinctions:

Nature of Library Science	Nature of Information Science
an activity	- a science
the applied component	- a basic and research-oriented discipline
an applied aspect	- an interdisciplinary science

an application	- a technology
a practice	- a science
a practice	- a body of theory and facts
institutional techniques	- a diversifying profession
an institutional profession	- a discipline or series of tools
a professional group	- a science and technology
a professional discipline	- theoretical foundations
a professional discipline	- a theoretical discipline
a professional field	- a branch of knowledge
a service	- a family of retrieval-based information services
services	- engineering and science
a service agency	- a basic science
a societal agency	- a scholarly discipline

D) A Unified Domain

The definitional literature that has argued for the existence of one unified domain of library science and information science has not revealed, nevertheless, a unified conception of the nature of that domain. The following diversity of characterizations illustrates this:

an art
a discipline
a developing cross-disciplinary field of problems
an interdiscipline
an interdisciplinary field
a field
a field of study, technology, and services
a profession
a corpus of professional knowledge
a professional field of activities
a science
a service
a service activity
a service industry
a social activity
a technology

E) A Superordinate Domain

In this category are descriptions of the nature of a superordinate domain taken as subsuming library science and information science:

a body of analysis techniques
a new discipline
a field
a field of inquiry
an interdisciplinary field
an emerging profession
a profession
a new science
a study

In addition to the descriptions that are listed above, the nature of library science has also been characterized in many ways. Among these are the following: a bibliothecal activity, a fine art, the library art, an arm of mass communication, a craft, an epistemological discipline, a multifaceted discipline, a scientific discipline, a service discipline, a form of intellectual engineering, an educational enterprise, a philosophical enterprise, a social enterprise, an interdisciplinary field, a mission-oriented field, an institution, a social institution, a body or branch of knowledge, practical knowledge, scientific knowledge, elemental laws, a branch of learning, a management or administration, a method, an office, an organization, a phenomenon, an empirical phenomenon, a metaphysical phenomenon, principles, normative principles, a body of problems, a process, an evolving profession, a learned profession, a personal service profession, a scientific profession, a semi-profession, a service profession, a role, a department of scholarship, a science, an applied science, a communication science, a social science, a social

service, a skill, a field of study, a scientific study, a task, a technique, a vocation, and a work.

The nature of information science has similarly been conceived in many ways in addition to the characterizations listed above. Among them are the following: an act, a field of activity, a spectrum of activities, an inter- or supra-disciplinary activity, an art of practical necessity, computer applications to library problems, a craft, a communication research discipline, an emergent discipline, an evolving discipline, an integrative discipline, a composite discipline, a synthetic discipline, an inter-discipline, an interdisciplinary discipline, a macro-discipline, an applied discipline, a practice-oriented discipline, an occupational field, a professional field, a developing field, an emerging field, a multidisciplinary field, a humanities, a body of knowledge, an instrumentality, a process, a developing profession, an immature science, an infant science, an emerging science, a practical science, an applied science, a pure and applied science, a synthetic science, an integrating science, a multiple paradigm science, a pre-paradigmatic science, a trans-science, a metascience, a soft science, a social or behavioral science, a branch of the political sciences, a professional specialization, a field of interdisciplinary study, a technique, a group of techniques, a technology, an agglomeration of technologies, and a federation of technologies.

2.2. Evaluation

Just as the definitional literature reveals a wide variety of names for library science and information science, so too it contains a wide range of views about their respective natures. The attempts to distinguish between them on the basis of philosophical, sociological, and attitudinal dichotomies - study versus practice, science versus profession, science versus humanism, innovation versus tradition - are confused and unconvincing. The metaphors centering on "spectrum" and "continuum" are similarly dubious.

Advocates of these dichotomies appear to be unaware that a domain possesses both cognitive and social dimensions. A science, for example, is advanced by a community of knowledge seekers, and their social activity as scientists constitutes the profession of science. Kuhn [54, p. 179], for example, noted the need to treat of "the changing community structure of the sciences" in historical explanations of scientific development.

Similarly, Toulmin [55, p. 218] delineated the twin features of any rational enterprise: disciplinary status and professional status. He argued that:

> [The] conceptual genealogy of an intellectual discipline has to be embodied in the human genealogy of a scholarly or scientific profession. . . .

A profession, Toulmin [55, pp. 262-263] wrote, is the institutional embodiment of the intellectual discipline, the "socially structured human agency by whose activities it is carried forward".

Thus, a domain is a duality of discipline and community, of intellectual problems and goals, together with the profession of inquiring scholars, the knowledge-seekers, who formulate and extend those problems and goals.

With respect to a domain of social practice, then, theory and theoreticians are integral to it, not a separate domain marked off from practice and practitioners. Research in an applied field is part of the field.

In a social domain, manifestations of practice are the substance and motivation for theoretical inquiry. Buckland [28, p. 16], among others, has argued this view:

> Information science must do more than be a theoretical activity. It must relate in some way to activity involving access to information. (emphasis in original)

Similarly, Roberts [56, p. 256] wrote that:

> The complementary activities of theory and practice have only one aim, the improvement of the presentation, transfer and use of information. These ends are practical. It is this practicality that gives to information science its significance and meaning, and gives to theory its purpose.

Just as educational theory and practice, for example, form the domain of education, so too must theory and practice in library science or information science, or some conjunction thereof, be logically and conceptually linked in the same disciplinary domain. Theoreticians and practitioners are not in separate domains, or in parent-offspring or set-subset relations. They pursue similar goals: the enhancement of

service to individuals in society.

Similarly, educators are in the disciplinary domain of practice, even though they are not practitioners themselves but rather teachers for practice.

The attempt to characterize information science as innovative in contrast to library science as traditional is an even more inadequate and short-sighted distinction. It is a truism that what is new and exciting for today's generation is old hat for tomorrow's. Indeed, in less than a decade, library information service has gradually absorbed several new technologies: video and compact disc are being added to collections, online and CD-ROM searching are replacing print sources, online library catalogues are commonplace, and computerization of many other service and managerial functions is progressing.

Not only are technological innovation and adaptation evident, it is also evident that non-traditional client groups are of increasing importance to practitioners and theoreticians alike. White [57], for example, has observed that, although librarianship has been associated historically with the goals and programs of education, culture, and scholarship, its practice is now becoming more oriented toward the business community. Hence, the link between innovation and business orientation is not an appropriate distinction on which to base a separate discipline of information science.

With regard to the domain distinctions found in the definitional literature that are based in analogy and metaphor, the use of these linguistic devices suffers from vagueness and imprecision. Analogies and

metaphors are not self-evident. The reason why two things are considered to be analogous or related metaphorically must be specified.

One illustration is Taylor's [58] view that there exists a spectrum of "knowledge packages", with the book at one end, the document in the middle, and the information bit at the other end, with each type of package marking off its respective domain, namely, librarianship, documentation, and some as yet unnamed domain. The spectrum concept as presented here is flawed because the book and document are not comparable to the information bit, but rather to a computer tape or disk: the bit is to the computer what the print character is to the book.

In summary, the definitional literature provides considerable evidence that, for many writers, information science is "non-conventional library science," that technological innovation and experimentation have heralded a new domain. This is a peculiar view that has not similarly infiltrated other domains such as medicine, law, or engineering. While qualitative change in available technology may radically alter existing practices, such technology does not inaugurate a twin discipline: computer-based library science does not transform itself into another domain with another name, another nature, another content, another focus, and another function.

3. The Content of the Domain

3.1. Explication

Another major distinction in the definitional literature claims that information science and library science handle different types of content.

The oldest approach was to argue that books were the province of library science and documents the province of documentation. As early as 1908, the International Institute of Bibliography delineated the domain of documentation as "documents of all sorts in all fields of human activity" (quoted by Schultz and Garwig [59, p. 153]). Their delineation did not mention library science.

A more contemporary approach has been to view information science as concerned with information and its properties, and library science as concerned with physical objects - books, documents, graphic records, recorded discourse, and so on. Haan [60, p. 222], for example, claimed that:

> Documentation has been defined so broadly as to include all the activities of libraries. In common usage, however, the word librarian suggests primarily one who forms a collection of books, whereas the word documentalist implies one who disseminates information.

Almost twenty-five years later, some writers were still making similar distinctions. Vickery [61, p. 156], for example, argued that:

> [Information science] is concerned with all forms of message within the domain under consideration. A further boundary problem within any aspect of human communication is that we may distinguish messages that 'inform' from those that instruct,

> persuade, entertain, or have other import - and consequently may wish to restrict IS [information science] to the study of 'informative' communication (whereas . . . [library and information] work is also concerned with instructional, propagandist and recreational documents).

In fact, the proliferation of notions in the definitional literature of information science of what is meant by the term 'information' staggers the mind. Schrader [62] identified 134 variant notions, among which were the following: knowledge, the state or process of knowing, understanding, enlightenment, intelligence, wisdom, facts, data, data of value in decision-making, ideas, news, message content, the semantic content of a message, meaningful reference, a stored item, the meaning contained in a stored item, the act or process of becoming informed, novelty, communication, recorded marks, interpretation of external stimuli, perception, change in perception, sensory stimulation, consciousness, the summation of man's experience, uncertainty, reduction or resolution of uncertainty, a mathematical function applied to stored codes, that which holds society together, culture, an environment, a result of the interaction of a system with its environment, a commodity, a product, a saleable product, a basic resource, a form of metaenergy, superenergy for the brain, a basic entity of the universe, a fundamental phenomenon, a physical process, a social process, a human process, a psychological process, a neural process, a biological process, a chemical process, and even, all life.

In addition to this diversity of notions about the nature of information, many other terms have been used to describe domain content. Among them are: informative communication, the totality of what is

crystallized from human thought, documentary communication, documentary discourse, recorded discourse, verified information, authenticated information, new information, existing literature, text-bearing media, the collective memory, objects of cultural and intellectual authority, informative objects, signal-bearing objects, text-bearing objects, information packages, print culture, public knowledge, information-bearing records, records of intellectual activity, representations of representations of knowledge, data resources, signs and symbols, texts, informative texts, and informational units.

In addition to differentiations on the basis of domain content, many writers have insisted that institutional setting is the essential characterizing feature of library science, in contrast to the non-institutional orientation of information science. A typical expression of this view is a statement by Tague [25, p. 90]:

> Perhaps the safest statement that can be made about the relationship of library and information science is that they are overlapping but not co-extensive disciplines. The former is concerned with all aspects of library operation and practice; the latter with the characteristics of public information and the behavior of its users. The boundary between the two is difficult to fix.

3.2. Evaluation

The analysis reveals that another common claim in the definitional literature has been to distinguish information science from library science on the basis of their content, or, the objects respectively handled: that information is the province of the former and physical records of the latter.

Differentiation on the basis of domain content dates back to the early days of documentation when its province was claimed to be all kinds of documents. Taube [63, p. 167] noted that, during the first half of this century, the growth in the importance of new forms of literature, such as report material and vertical file material, had important implications for the practice of library science. This growth, he argued,

> . . . converted a peripheral concern to a central activity. The important content of these reports seemed to justify not less, but more organization than that accorded to books and periodicals. And suddenly the fetters of traditional librarianship burst. The finished schemes of the nineteenth century could not contain the swirling rush of new literature and new forms of literature. New systems had to be created, new methods of publication and dissemination devised, new methods of identification and organization devised.

With the shift in the 1950s and 1960s from documents to information as the content focus of documentation cum information science, the meaning of the term 'information' has rapidly lost all coherence. The definitional literature reveals well over 100 variant usages - usages that, for the most part, are arbitrary, idiosyncratic, atheoretical, and lacking historical and conceptual rigor.

Fairthorne [64, p. 10], an eloquent critic of fuzzy theorizing, derided the careless usage of the term 'information':

> People are reluctant to believe that nouns do not refer to some external entity. This is one reason for the widespread belief, conscious or unconscious, in what is most aptly called "The Phlogiston Theory of Information."
>
> This is analogous to the eighteenth-century theory of caloric and is equally harmful, distorting and obscuring the proper nature and targets of the information sciences. Use of "information" as the name of some universal essence, that can be squeezed out of texts like water from a sponge, blurs fundamental differences such as that between a library and a laboratory, an

> answer and a response, a command and a question, a fact and a factual statement, an event and a record of the event, and so on. All these distinctions are fundamental.
>
> Fortunately, one does not have to use the word "information." Always, if we put our minds to it, we can say what we mean.

Fairthorne's views were echoed a few years later by Auerbach's [65, p. 217] experience at an advanced study institute on information science that was sponsored by NATO. He wrote:

> I have listened with great care to all the fine speakers who have given very different concepts for the word information - and yet each of them has agreed that all the others are correct! What is even more confusing is that they have sometimes incorporated these conflicting definitions within their own.

He [65, p. 219] urged that an effort be made to define fundamental concepts and that a few words be banned - "the first being information."

Concomitant with this proliferation in meaning, some writers have argued that information is too broad to be the content focus of any one domain. Licklider [66, p. 165], for instance, rejected the notion that information science is the science of information:

> The domain of information is too extensive for this small group [information science] to master or to govern. Why should we stake a claim, at this late date in the history of science, to territory occupied so long by logicians, mathematicians, psychologists, and artists, not to mention propagandists, spies, and many others whose subject is information.

Finally, the focus on information as domain content does not provide a sufficient principle for domain differentiation, for two reasons, one historical, the other conceptual.

Historically, the claim that information is the province of

information science is not defensible, for at least one important segment of library science, the Special Libraries Association, was founded in 1909 with a clear focus on the centrality of information to both social practice and research.

Conceptually, the claim that information is the content handled in information science can not be supported. As Taube [49, p. 91] pointed out:

> There have been writers in this field who have made sharp distinctions between retrieving "information" and retrieving a physical item which contains the information. I think it is a simple matter to show that the differences here are differences in degree. The information which is retrieved is always physical. It is a message of some kind.

Sergean [67, pp. 7-8], similarly, rejected the content distinction as a rationale for information science, contending that "librarianship and information work" should be regarded

> . . . as a single service industry or activity dealing with a common commodity (namely, information) in various forms. . . . This applies whatever the purpose or setting involved. Cultural and recreational material is just as informative as advisory or instructional material, if one regards information as the basis for attitudes, decisions and behavior.

Buckland [20, pp. 22-23] also argued that what is handled, regardless of the designated domain neologism, is not information per se, but rather text-bearing media and their representations, or, in his words, "representations of representations of knowledge".

Equally misdirected as the information content distinction is the claim that library science is institution-bound. This claim confuses

domain content with domain setting: a library is not the content of library science but rather the institutional setting within which a content is transmitted.

Buckland [28, p. 16] has criticized the attempt to differentiate domains on the basis of institutional setting:

> There persists a widespread assumption that "data processing applied to libraries" and "information science" are largely synonymous. . . . I had thought that the phlogiston theory of converting base metals into gold was a fantasy until it occurred to me that systems analysis when applied in other contexts is business administration, but systems analysis applied to libraries mysteriously becomes information science.

Rayward [5, pp. 360-361] has provided an informative perspective on the institutional and content roles of libraries:

> Libraries may be regarded as a major institutionalized response to the problems of providing generalized access to the record of what is known They are a complex organization of access mechanisms.
> . . . .
> A narrow and conventional definition of a library expresses a limited view of the format of the records involved and modes of access provided to them. But if these limitations are abandoned, libraries may be thought to embrace not only the arrangement and services of traditional libraries but of information centers and data archives as well. Traditional libraries fall into place on a historical continuum that has arisen as institutionalized responses to the need to provide access to information in recorded form have been developed, examined, and modified.

Hence, the attempts to distinguish library science from information science on the basis of differences in content handled and institutional context are conceptually unconvincing.

4. The Focus of the Domain

4.1. Explication

Domain focus is a level of linguistic ordering that is intimately tied to domain function: some functions inhere in things, for example, collection management concerns objects collected; while other functions inhere in persons, for example, the act of informing treats of human recipients exclusively.

Hence, three fundamental categories of domain focus can be identified in the definitional literature of library science and information science. These are: an emphasis on objects or artifacts, an emphasis on subjects or people, and an emphasis on both objects and people.

4.2. Evaluation

In considering the generic function of a domain, the focus can be on functioning with respect to objects, people, or both. But in a social domain - which is a basic premise of the analysis in this study - the focus of domain functioning must take into account both objects and people.

Hence, domain definitions that focus exclusively on objects - libraries, collections, information - are inadequate because they exclude the human being from consideration.

Analysis of the definitional literature reveals that this incompleteness characterizes all the domain functions identified under "Objects" in Table 1 in the section that follows. For example, a definition such as, "information science is the study of information and

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its properties", suppresses the human social element implicit in the reference to information.

Equally incomplete are those definitions that have focused exclusively on people, because the place of objects in the domain is ignored or treated as inconsequential.

Only those definitions that treat of both objects and people meet the elementary criterion of a social domain, namely, that functions must be specified which interrelate these domain components.

5. The Function of the Domain

5.1. Explication

Within these categories of domain focus according to object and person orientations, definitions can be subdivided by the primary or generic function claimed for the domain or domains.

The table below shows a typology of generic functions. It identifies 30 such functions, in total represented by more than 340 synonymous, quasi-synonymous, and pseudo-synonymous terms, each variant term purporting to capture the essence of library science and information science, whether as separate domains or as a unified domain.

The table compares the generic functions that have been claimed by writers to differentiate library science from information science, together with those generic functions that have been claimed as the essence of a unified domain.

Table 1

Typology of Generic Functions Claimed as the Essence of Library Science and Information Science

Generic Function	Library Science	Information Science	Unified Domain
1. Objects			
1.1. To make accessible	x	x	x
1.2. To retrieve	x	x	x
1.3. To transfer	x	x	x
1.4. To process	x	x	x
1.5. To create and transfer		x	
1.6. To create and use		x	x
1.7. To use or make useful	x	x	x
1.8. To analyze			x
1.9. To evaluate		x	x
1.10. To keep or manage	x		
1.11. To manage or control		x	x
1.12. To describe books	x		
1.13. To regulate book production	x		
1.14. To protect books	x		
1.15. To study		x	
2. People			
2.1. To teach	x	x	x
2.2. To enlighten or inform	x	x	x
2.3. To create readers and elevate literary taste	x		
2.4. To inspire	x		
2.5. To amuse or entertain	x		
2.6. To study human cognition		x	x
2.7. To study knowledge		x	
2.8. To conduct research and advance knowledge	x	x	
2.9. To manage knowledge	x		
2.10. To control knowledge		x	
3. Objects and People			
3.1. To make accessible	x	x	x
3.2. To retrieve	x	x	x
3.3. To transfer	x	x	x
3.4. To process		x	x
3.5. To supply	x		
3.6. To counsel	x	x	x
3.7. To advocate	x		
3.8. To link	x	x	x

3.9. To create and transfer		x	x
3.10. To create and use		x	x
3.11. To use or maximize utility	x	x	x
3.12. To analyze			x
3.13. To evaluate		x	x
3.14. To interpret	x		x
3.15. To manage	x	x	x
3.16. To mechanize		x	x
3.17. To study	x	x	x

This table shows that virtually every generic function claimed as unique to library science was claimed as unique to information science, and, moreover, as the unique function of a unified domain of library science and information science, too.

5.2. Evaluation

Analysis of the definitional literature reveals a wide diversity of views about the central functions of library science and information science. Moreover, most of the functions claimed to be unique to one of the two domains were also claimed to be unique to the other. Almost every function has been used as an argument for a separate domain.

With respect to some of the functions in the definitional literature that focused exclusively on people - teaching, studying human cognition, studying the nature of knowledge, and conducting research to advance knowledge - these are the functions of already well-established, unique domains of social activity and formal inquiry: education, cognitive science and psychology, epistemology and logic, and scholarly inquiry in all fields, respectively.

Other functions that related exclusively to people - enlightening,

informing, inspiring, and amusing - are too broad to be claimed as unique to any one domain. They are functions properly charged to political and social philosophers, to spiritual leaders, and to educators, and they are also a general description of the activities of a variety of other agents including journalists, publishers, counsellors, and entertainers of various kinds.

Finally, other functions that would appear to relate exclusively to people - managing and controlling knowledge - are inappropriate and inadmissible functions in any liberal human society. These functions involve control over and direction of ideas and so ultimately, control over and direction of human beings. Although censorship control is not the only interpretation of knowledge management - one aspect of management is supportiveness and nurturing - the concept is too slippery to merit endorsement.

In this regard, the notion of "information management" has particularly insidious overtones that are gradually being recognized - just at the time when this neologism is coming into vogue. Asheim [68, p. 191] has warned:

> That little phrase "control of recorded knowledge," which originally meant simply "full bibliographical information" that would increase ready access to the content, has begun to take on quite another meaning: the withholding of information, not its improved dissemination.

Moreover, the definitional literature reveals that almost all of the terminology referring to generic functions is used interchangeably as conceptually equivalent.

Thus, "to make accessible" was used synonymously with "to retrieve", "to transfer", "to handle", "to link", "to organize", "to control", and "to manage".

The term "to retrieve" was also used synonymously with "to process", "to handle", "to manipulate", "to analyze", "to disseminate", "to transmit", "to mention and deliver", "to communicate", and "reference work".

The term "to transfer" was also used synonymously with "to link", "to process", "to handle", "to assimilate", "to control", and "to manage".

The term "to process" was also used synonymously with "to store, to transmit", "to disseminate", "to analyze", "to organize", "to select", and even "to reproduce".

The term "to counsel" was also used synonymously with "to educate", "to link", "to communicate", and "to retrieve".

And the term "to create" was also used synonymously with "to transform".

Frequently, the generic terms appear as conjunctions or as double-noun terms: "to retrieve and disseminate", "to transmit and receive", "to process and manage". There are also such usages as "transmission link".

Thus, the terminology used to characterize generic functions is not mutually exclusive, but suffers from substantial overlap. The magnitude of casual substitution of terms is illustrated in the following passages from Vickery [69, pp. 279-280]:

> Documentation is a practice concerned with all the processes involved in transferring documents from sources to users.
> . . . .
> [Documentation] is . . . all forms of document . . . handling,

> from production to delivery. The document system then becomes very much wider than conventional librarianship - it includes publication and printing, distribution, some forms of telecommunication, analysis, storage, retrieval and delivery to the user.
> . . . .
> The aim of the [documentation] system should be to link authors (or at any rate their products) to users. As well as giving service to all potential users, the documentation system should seek to disseminate all documents.
> . . . .
> Information transfer is essentially a relationship between people.

There are several other fundamental weaknesses with most of the generic functions. In the first place, no clear notion is presented of the role or function of the receiving agent (client, customer, patron, user). What is the user doing in interacting with the information specialist or librarian? For example, many definitions state that library science is the management of collections for use: but collections for use by what (or by whom), and collections for use for what, are not stated. Use by people can not simply be assumed.

Similarly, in a common definition that appears in information science, that it is the study of information and its properties, the human context is suppressed.

Related to this is the fact that very little of the definitional literature focuses on the domain as a social system of interacting agents.

The most elaborate function-based approach to occupational definition is found in the study by Debons, King, Mansfield, and Shirey [70, p. 4]. They attempted to develop a functional definition of the notion of an information professional in order to guide their large-scale manpower survey.

Their definition of an information professional focused on "those professionals involved in data and information work on behalf of others" (emphasis theirs). This was elaborated further [70, p. 31]:

> An information professional may be differentiated from other professionals who may also work with data by the fact that s/he is concerned with content (the meaning applied to symbols) and therefore with the cognitive and intellectual operations performed on the data and information by a primary user.

The characterization that they developed, however, can not be considered conceptually adequate. In essence, no explicit function was stipulated in their work: they did not define what they meant by "involvement", "data and information work", "on behalf of others", or "concern with content".

These notions are not self-evident and consequently their definition is merely circular, lacking the necessary precision required for guiding and sorting out those activities included in the domain function from those excluded. An adequate principle for classifying instances into functions is missing.

It was all the more unfortunate, therefore, that the study of information professional competencies by Griffiths and King [71, p. 6] was based in part on the Debons approach to conceptualizing the domain of interest. They wrote:

> Generally, we consider the information industry to comprise all organizations, groups and individuals that handle information on behalf of others.

In spite of their reliance on the Debons approach, however, Griffiths

and King excluded computer programmers from the domain; this was contrary to what Debons and his colleagues had done. Later, they also revealed that their study population was limited to those who had graduated with a Master of Library Science degree [71, p. 34]. This was also contrary to the earlier approach. Still later, they conceded a third deviation: that the functional groupings identified in the Debons study were too broad for their purposes, and so their study population formed only a subset of that identified by Debons and his colleagues [71, p. 301].

Hence, the attempts to distinguish library science from information science on the basis of differences in generic function are conceptually inadequate.

Summary Evaluation

The analysis of the definitional literature that has been reviewed here reveals a domain in crisis over its central identity. In spite of quantitative proliferation, this inquiry has found the extant definitions of library science and information science wanting.

The definitional literature is characterized by disagreement, contradiction, and inconsistency in the terms used to conceptualize the domain. The frequent use of vague, idiosyncratic and atheoretical terminology has resulted in linguistic chaos. Logical and conceptual fallacies abound: "information phlogistics" is still with us.

Nowhere is the absence of conceptual rigor more manifest than in the flawed attempts to tease apart a domain of information science from a domain of library science. There is no consensus in the definitional literature on the principles that would differentiate them. There is no consensus about the proper name for each domain, about their respective natures, their content, their focus, or their central functions. The terminology of domain differentiation is a rhetoric of labels - the manifestation of linguistic fashion rather than logical analysis. Changes in labels have outpaced advances in conceptualization.

Vagianos [72, pp. 2, 19], in a comprehensive review of the literature relating to forms of education for scientific and technical information work, observed that:

> We have heard much talk (and contributed some ourselves) of "information managers", "information scientists", "subject specialists", "information specialists", "information technologist", "technical information specialist", "librarian technician", but no one has thus far defined each "animal" in

> sufficient detail to serve as a prototype.
> . . . .
> Determining at the outset who and what we are talking about is impossible. The field is so shrouded in semantic fog that it is hard to tell the players without a program. Any one who reviews the incredible display of titles culled from the literature . . . will recognize that any attempt to introduce common terms, thus order, would be futile. The nature of the human animal ensures the rapid proliferation of synonyms - particularly a large assortment based on sheer preference in nomenclature.

Rosza [73, p. 58] made similar observations:

> [As] to the theoretical definition of documentation, it is not less uncertain and vague than that of library science. The variety of designations of information activities - 'documentation', 'scientific documentation', 'documentology', 'documentalistics', 'scientific information', 'information science', 'informatology', 'informatics', and the like are all synonyms for one and the same thing which by itself shows a theoretical uncertainty. (emphasis in original)

So much of the common professional language has been debased or discarded in the use of these changing labels that it has become difficult to judge the definitional literature. There is no common historical and conceptual context for evaluating the relevance of new ideas - no way of determining what is new from what is merely new labelling, new rhetoric.

Inadequate conceptualization of the domains of library science and information science has been confirmed empirically in a recent study by Houser [74] of the papers published in the first 15 volumes (1970-1984) of the Journal of the American Society for Information Science (JASIS). He discovered that the largest single block of identifiable authors were university professors employed in graduate programs of library science education.

In view of this institutional affiliation, another of his major findings should not come as a surprise: that some seventy per cent of the JASIS papers were about library science subjects, with bibliometrics and indexing being the most frequent. (His criterion for determining the domain of library science was simply whether or not a subject was currently taught in graduate programs of library science education.)

In conclusion, he [74, p. 22] noted that "the information science emperor was - if not naked - then merely wearing the robes of library science."

These findings echo those of a statistical analysis by An [75, p. 169] regarding vocabulary change in information science from 1951 to 1974, as reflected in Information Science Abstracts (ISA) and its predecessors, Documentation Abstracts, American Documentation, and Chemical Literature. She discovered that the most frequently-mentioned indexing terms were "information" and "library", and in conclusion she observed that:

> The formation of the nucleus [of indexing terms] by "information", "library", "libraries", and "technical" indicates that Information Science, as defined by ISA, is strongly library oriented. But the editorial notes in ISA have been ignoring this fact.

Regardless of these empirical findings, the analysis reported here shows that the conceptual landscape that can be mapped from the definitional literature is dominated by several major obstacles to theory building and scholarly consensus. These obstacles are: the poor quality of theoretical inquiry, a weak citing tradition, the absence of a striving for universality and generalizability, an obsession with technological innovation and scientific progress, and a lack of appreciation for the

central place of function in domain conceptualization.

The poor quality of theoretical inquiry is a major obstacle to conceptual progress. This is attributable in part to the positivist assumption that raw experience is self-evident: the empirical approach to domain theorizing is misguided. To conceptualize a domain is to perform philosophical inquiry, and thus the methods of philosophy must be employed. Among these are phenomenological analysis and logical analysis (see Steiner [35]).

Moreover, it is uncommon to find a paper that presents definitions for both library science and information science, even when the premise is that they are different domains. The more usual course is for the writer to define the favored domain, assert its self-evident superiority, and then shift to some other subject matter, leaving the unfavored domain in linguistic purgatory.

Concomitant with poor theoretical scholarship is the existence of a weak citing tradition in the definitional literature that has permitted inadequate conceptualizations to go unexamined and unchallenged for half a century. There is a pervasive penchant for reinventing the "conceptual wheel." Terms are frequently defined "for the purposes of this study", without acknowledgment that prior related thought exists.

Further, most of the extant citing is repetitious and superficial. There is little analysis of the adequacy of the cited claims: the previous work is simply taken at face value, and thus a chain of weakly-linked concepts emerges from the definitional literature.

Borko's [46] attempt to define information science is typical of

these weaknesses: he cited neither the previous literature of library science and documentation, nor the Proceedings of the Conference on Training Science Information Specialists [43], from which his own definition was presumably derived.

Another impediment to conceptual evolution is the absence of a striving for universality and international generalizability in the definitional literature. American writers, in particular, have exhibited a stubborn parochialism in their approach to domain conceptualization. Indeed, much of their effort has been narrowly based in American political and social ideology, in efforts to serve American military and national security interests (see Richards [76]).

Other impediments to conceptual evolution have been the obsessions with technology and technological advancement, and concomitantly with science and scientific progress. Technological innovation has been perceived to herald a new domain instead of a new means for achieving time-honored social goals. But adding computer or other technology to a domain function creates neither a new function nor a new domain.

Science and scientific progress have also been perceived as the magical solution to domain conceptualization. But not all problems are empirical, and the social prestige that is vicariously gained in association with the scientific label may well be an expiring phenomenon in advanced societies.

Finally, the most important impediment to conceptual evolution has been a lack of appreciation for the central place of function in domain conceptualization.

This central place of function in conceptual analysis is well recognized. From a philosophical point of view, the function of an endeavor determines its form and content. Steiner [77, p. 58] described the connections this way:

> There is deliberateness in human action, and so doing is structured, given form and content, in terms of an outcome, a function.

Some writers in the definitional literature have recognized that function is the key to domain conceptualization. Egan [78, p. 203], for example, observed that:

> The long-continued demands of the library profession for "scholarship", "intellectual content", a "philosophy" or a "theory" sometimes have a rather hollow sound. A study of the profession and its rise among other somewhat similar groups should serve two purposes - it should separate "status" aspirations from truly professional requirements, and it should define exactly what the function of the profession is in relation to society at large, a question which has not been satisfactorily settled among librarians themselves.

Thus it is that in the extant definitions of library science and information science, there is no sense of conceptual evolution, no sense of an emerging enrichment of the fund of intelligence. Rather, the sense is of conceptual obscurity, elaborate argumentation, and ill-tempered disputation about terms. The crisis in domain terminology has produced conceptual inertia and intellectual confusion. Conceptual progress is thus inhibited. The fund of intelligence lies dormant.

While there may well be a delicate tension within a scholarly community at any given time between consensus and diversity, the inability

to agree on fundamental concepts of self-identity inevitably leads to dissension and confusion. Conceptual evolution is impeded by elaborate argumentation over fuzzy names, vague notions about the nature of the domain, slippery ideas about domain content, an inadequate focus on the interactions between domain objects and human agents, and the casual substitution of terms to describe generic functions.

Fairthorne [36, p. 9] warned a quarter of a century ago that:

> Inevitably, emerging activities breed ill- conceived words that at first obscure and obstruct rational action, the stubborn survivors remaining to plague students indefinitely. For terminology reflects theory, implicit or explicit, and no activity starts off with correct or even clear-cut theory. Also, because of impatience as well as slovenliness, terms are often ill-considered as well as ill-conceived.
>
> However, in our field, terminological corruption has gone well beyond what is inevitable into what is scandalous. Some, indeed, is deliberate exploitation of vogue words for money or prestige. . . .

In spite of the self-evident inadequacies in the definitional literature, one may presume that few writers have heeded the words of John Stuart Mill:

> The tendency has always been strong to believe that whatever received a name must be an entity or being, having an independent existence of its own. And if no real entity answering to the name could be found, men did not for that reason suppose that none existed, but imagined that it was something peculiarly abstruse and mysterious. (quoted by Gould [79, p. 320])

That is the condition of twentieth-century attempts to differentiate between library science and information science.

What is needed, then, in order to advance conceptualization and consensus about the domain, is vision beyond science, beyond technology,

beyond professionalism, to a more basic level of understanding. What is needed is a more logically rigorous means of marking off a universe of discourse, in which essential components are specified and their functional interrelations delineated. What is needed is a unifying theory that will map out a unique domain, ground its central function and technology in a societal context, synthesize and simplify its terminology, and articulate an agenda of problems for inquiry. The tradition of rhetoric and ill-conceived labelling must yield to the logic of definition and to the articulation of the concepts that are central to such definition.

There are promising beginnings in the work of several theorists. A monograph by Buckland [20], Library Services in Theory and Context, provides a fruitful, if incomplete, framework for further theoretical explication. Similarly, Houser's [80] typology of the production and use of documents taken as records of social discourse merits serious attention by future theorists. In addition, writers as different as Buckland [20], Rayward [5], Schrader [62, 81], Shera [2], and Winter [82] have argued that the central function of the domain ought to be conceptualized as facilitating or guiding access.

Rayward [5, p. 356] has perceived a trend of disciplinary convergence of librarianship toward information science, and even an "emergent disciplinary integration" between them. Much earlier, Shera [1] predicted that eventually a consensus and a common understanding would be achieved.

This study presents the conviction that the unifying force for a coherent, convergent discourse about the domain will be found in the

recognition of our unique social practice. It is social practice that will determine both service and research objectives for the community of scholars and practitioners, and that will guide them toward a consensus on their problems and prospects.

That recognition and consensus are the challenges to the new generation who inherit the twentieth-century legacy of intellectual confusion about the nature of library science and information science.

Postscript

Some may judge this evaluation of extant definitions of library science and information science to be unnecessarily harsh and negative. This has not been my intention. My interest in the problem of domain conceptualization has been inspired solely by a desire to advance our theoretical standing among the human sciences, and to contribute to the advancement of human understanding.

Stephen Toulmin's [55, p. 35] words have provided an eloquent motivation to this inquiry:

> Each of us thinks his own thoughts; our concepts we share with our fellow-men. For what we believe we are answerable as individuals; but the language in which our beliefs are articulated is public property. (emphasis in original)

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